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REMARKS

Claims 1-24 are pending in the present Application. Claims 6-8, 19, and 22 have been amended, and Claims 25-26 have been added, leaving Claims 1-26 for consideration upon entry of the present Amendment.

Claims 6-8, 19, and 22 have been amended for clarity and to correct minor informalities in the claims. It is noted that none of these amendments are narrowing and none are made to overcome the prior art.

Support for the amendment to Claims 6-8 can at least be found in the specification at paragraph [0036]. Additionally, support for the amendment to Claim 8 can at least be found in the specification at paragraph [0022].

Support for the amendment to Claims 19 and 22 can at least be found in the specification at paragraphs [0022] and [0025].

No new matter has been introduced by these amendments. Reconsideration and allowance of the claims is respectfully requested in view of the above amendments and the following remarks.

Claim Rejections Under 35 U.S.C. § 103(a)

Claims 1-24 stand rejected under 35 U.S.C. § 103(a), as allegedly unpatentable over U.S. Patent No. 6,214,066 to Nataraj et al. Applicants respectfully traverse this rejection.

Applicants' independent Claim 1 is direct to a process for operating a reformer system. The process comprises introducing a gas mixture to the reformer system; increasing a proportion of an oxidant in the gas mixture and controlling a flow rate of the gas mixture; and reacting the gas mixture to form a reformate stream and to increase a temperature in the reformer system, wherein the temperature is effective to remove a contaminant from the reformer system.

Applicants' independent Claim 19 is directed to a process for operating a reformer system. The process comprises introducing a gas mixture to the reformer system and contacting an oxidant in the gas mixture with a catalyst material disposed at an inlet to the reformer system to generate a reformate stream and to increase a temperature in the reformer system, wherein the temperature is effective to remove a contaminant from the reformer system; monitoring an operating temperature of the reformer system; increasing a proportion of the

oxidant in the gas mixture and controlling a flow rate of a fuel in the gas mixture to produce a peak operating temperature in the reformer system at a distance of less than or equal to about 10 millimeters from the inlet; reducing the flow rate of the gas mixture to zero and flowing the oxidant into the reformer system when the operating temperature is less than or equal to a first temperature; and reducing the flow of the oxidant to zero when the operating temperature is greater than or equal to a second temperature, wherein the second temperature is greater than the first temperature.

Applicants' independent Claim 22 is directed to a process a process for operating a reformer system, the process comprising: monitoring an operating temperature of the reformer system; reducing a flow of a fuel in a gas mixture into the reformer system to zero when the operating temperature of the reformer system is greater than or equal to a first temperature; flowing an oxidant into the reformer system when the operating temperature of the reformer system is less than or equal to a second temperature; reducing the flow of the oxidant when the operating temperature is greater than or equal to the first temperature; repeating flowing the oxidant into the reformer system and reducing the flow of the oxidant to zero until the operating temperature is at a third temperature that remains at or below the first temperature; and shutting down the reformer system when the operating temperature remains at or below the third temperature.

Nataraj et al. teach that "synthesis gas is produced from a methane-containing reactant gas in a mixed conducting membrane reactor in which the reactor is operated to maintain the product gas outlet temperature above the reactant gas feed temperature wherein the total gas pressure on the oxidant side of the membrane is less than the total pressure on the reactant side of the membrane." (Abstract). They further teach, "if the local oxygen flux is too high, and the endothermic reactions cannot kinetically keep up with the exothermic reactions to proceed to an extent sufficient to keep the region from overheating." (Col. 11, lines 48-51).

For an obviousness rejection to be proper, the Examiner must meet the burden of establishing a *prima facie* case of obviousness, i.e., that all elements of the invention are disclosed in the prior art; that the prior art relied upon, coupled with knowledge generally available in the art at the time of the invention, contain some suggestion or incentive that would have motivated the skilled artisan to modify a reference or combined references; and that the

proposed modification of the prior art had a reasonable expectation of success, determined from the vantage point of the skilled artisan at the time the invention was made. *In re Fine*, 5 U.S.P.Q.2d 1596, 1598 (Fed. Cir. 1988); *In Re Wilson*, 165 U.S.P.Q. 494, 496 (C.C.P.A. 1970); *Amgen v. Chugai Pharmaceuticals Co.*, 927 U.S.P.Q.2d, 1016, 1023 (Fed. Cir. 1996).

In making the rejection, the Examiner stated that "one of ordinary skill in the art would be motivated to avoid carbon deposition in the process of Nataraj et al., since it is well-known that carbon deposition poisons the catalyst." (O.A., page 3). Applicants agree with the Examiner, and teach the same in their background; "the catalysts used in the reformer system are sensitive to sooting and contamination. When sooting occurs, the active catalyst material can be fully or partially deactivated adversely affecting the efficiency and operating lifetimes of the reformer system." (Paragraph [0010]). In other words, it is well-understood in the art that soot is a problem, and avoiding soot would be preferred.

However, Applicants respectfully disagree with the Examiner that it would be obvious from Nataraj et al.

> to increase a proportion of an oxidant in the gas mixture fed to the reformer system to obtain a temperature effective to remove carbon from the reformer system or to reduce the flow of the gas mixture to 0 when the temperature of the reformer system is greater than or equal to a first temperature since Nataraj et al. recognize that the temperature and concentration of oxygen in the reactant feed will affect the amount of carbon deposition and that overheating should be avoided.

(O.A. pages 2-3).

Nataraj et al. is directed to a method of preventing carbon deposition in the reformer, but is silent on a method of removing any carbon deposited in the reformer. For example, Nataraj et al. teach "the presence of hydrogen or steam in the feed is beneficial for preventing carbon deposition." (Col. 12, lines 60-61; emphasis added). In contrast to Nataraj et al., Applicants teach "increasing a proportion of an oxidant in the gas mixture and controlling a flow rate of the gas mixture; and reacting the gas mixture to form a reformate stream and to increase a temperature in the reformer system, wherein the temperature is effective to remove a contaminant from the reformer system." (Applicants' Claim 1; emphasis added). In Claim 5, Applicants teach that the contaminant comprises "a carbonaceous material."

Furthermore, Nataraj et al. teach that "if the local oxygen flux is too high, and the endothermic reactions cannot kinetically keep up with the exothermic reactions to proceed to an

extent sufficient to keep the region from overheating." (Col. 11, lines 48-51). In other words, this teaching further emphasizes that Nataraj et al. is directed to preventing carbon depositions through reaction kinetics. Absent is any teaching or suggestion of increasing a proportion of an oxidant in the gas mixture with any reasonable expectation of success of increasing the temperature of the reformer to a temperature effective to remove contaminant. Rather, it is noted that Nataraj et al. teach a risk of overheating if the oxygen flux is too high. Hence, there is no motivation to change Nataraj et al. as suggested by the Examiner or any expectation of success. In order for one of ordinary skill in the art to modify Nataraj et al. as suggested by the Examiner, they would need to increase a proportion of oxidant in the gas mixture and control the flow rate of the gas mixture and react the gas mixture to form a reformate and to increase a temperature in the reformer system, wherein "the temperature is effective to remove a contaminant from the reformer system." (no motivation or expectation of success).

For at least these reasons, Applicants submit that independent Claim 1 is not obvious over and is therefore allowable over Nataraj et al. Moreover, as dependent claims from an allowable independent claim, Claims 2-18 are, by definition, also allowable.

In addition to those reasons stated above, independent Claims 19 and 22 are allowable over Nataraj et al., because Nataraj et al. do not teach or suggest "reducing the flow rate of a fuel in the gas mixture to zero and flowing the oxidant into the reformer system when the temperature is less than or equal to a first temperature." Rather, as discussed above, Nataraj et al. merely discuss controlling an oxidant flux to control reaction kinetics. Absent is any teaching of reducing the fuel flow rate to zero, while flowing oxidant into the reformer. As such, independent Claims 19 and 22 are not obvious over and are therefore allowable over Nataraj et al. Moreover, as dependent claims from an allowable independent claim, Claims 20-21 and 23-24 are, by definition, also allowable.

Claim Rejections Under 35 U.S.C. § 112, Second Paragraph

Claims 22- 24 stand rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In particular, the Examiner alleged that these claims are ungrammatical.

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Applicants have amended Claim 22 as suggested by the Examiner. More particularly, Applicants have inserted the word "is" before "greater" in line 5 of Claim 22 and before "less" in line 8 of Claim 22. In addition to this amendments, Applicants further amended the claim to correct other informalities noted in the claim. Accordingly, Applicants respectfully request that the Examiner withdraw this rejection.

It is believed that the foregoing amendments and remarks fully comply with the Office Action and that the claims herein should now be allowable to Applicants. Accordingly, reconsideration and allowance is requested.

If there are any additional charges with respect to this Amendment or otherwise, please charge them to Deposit Account No. 06-1130.

Respectfully submitted,

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